

Real Time Predictive Trajectory Pairing (RTPTP) Algorithm for Highly Accurate Tracking of Ground or Air Moving Objects

- c. Data Processor – It is part of the geometric pairing algorithm to compute the distance and adjust the distance based on the information from the second reference point about the same target. This is referred to as Geometric Pairing Adjustment.
- d. Mapping and Correction algorithm – This enables verification of location data, between RTPTP recursive polynomial output that provides the computation of target location data at the next time and measured geometric paired target location data. The final data is accurately predicted and presented to the data base.
- e. Data Base – This keeps a record of the location of targets with ID.
- f. Recursive polynomial executor – This executes the RTPTP polynomial described by Eqs. (1) – (3).
- g. Initial reference location and time is derived by the movement of the target and the corresponding location derived from GPS or other methods.

V. CLAIMS

This invention has the following claims:

- 1. Teaching of the design of the RTPTP polynomial of all orders for use in tracking, i.e. $n \geq 3$. The minimum order of 3 is critical to track the moving objects that can change directions in any manner. Even the order 2 polynomial is part of this invention.
- 2. Teaching of the design of the RTPTP architecture is claimed to be unique.
- 3. Teaching of the integration of RTPTP polynomial with Geometric Pairing system (or any other system) is Creation of concept of the architecture of combining RTPTP polynomial with geometric pairing for very accurate prediction.
- 4. Teaching of the system design that uses RTPTP polynomial integrated with any other methods, including geometric pairing of any number of reference points.
- 5. Teaching of the system architecture that contains any number of reference points.
- 6. Teaching of explicit procedure that uses 4 points (or higher) for initialization and then subsequent continuous tracking of the objects.
- 7. Teaching of the reference system architecture of RTPTP as illustrated in Fig. 2.
- 8. Teaching of the design of distributed management architecture of object tracking with normal exchange of tracking information between one pair of reference points and a second pair of reference points.
- 9. Teaching of accurate tracking of both direct and indirect targets.